

Software Delivery Validation

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Overview

This will be the 'software' counterpart of [this](#) work. The validation of the software configuration, should be performed against the requirements, that is preferably defined in a machine-readable format. Hence, this project relies heavily on an implementation of PDF 2.0 defined in CNTT.

Team

Name	Affiliation	Remarks
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Parth Yadav Parth Yadav	Delhi University	LFN Intern
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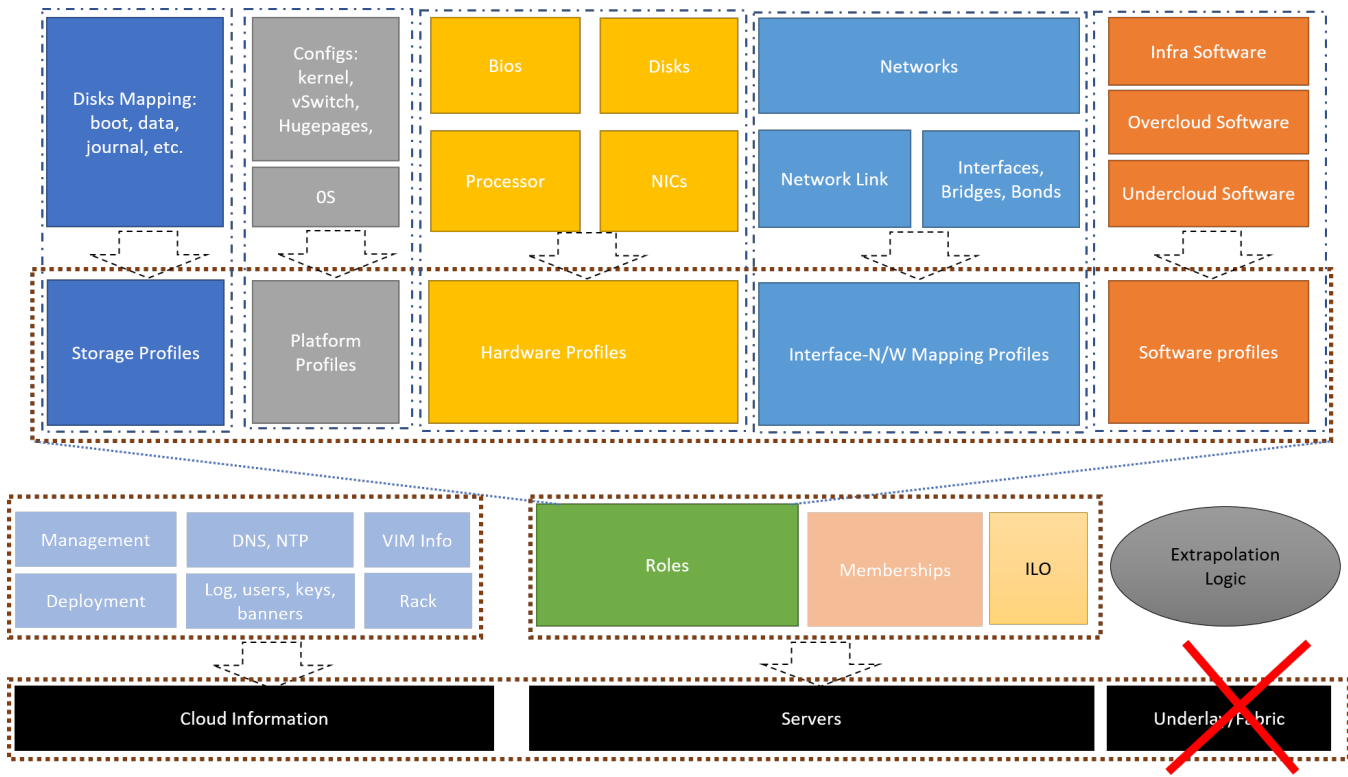
Implementation of PDF 2.0 in JSON

This implementation will be "SPECIFIC" to support software validation, and multiple installers/installations (Airship, TripleO, Fuel, etc). In this implementation, there will be parameters that are not part of CNTT-PDF. The implementation has two parts:

1. PDF-Template in JSON.
2. Site-specific PDF in JSON

The PDF-Template includes "extrapolation" information, which will help to create site-specific pdfs. The template will be filled by the user and extrapolated by the tool to create complete site-specific PDF.

The below figure summarizes the organization of the template.

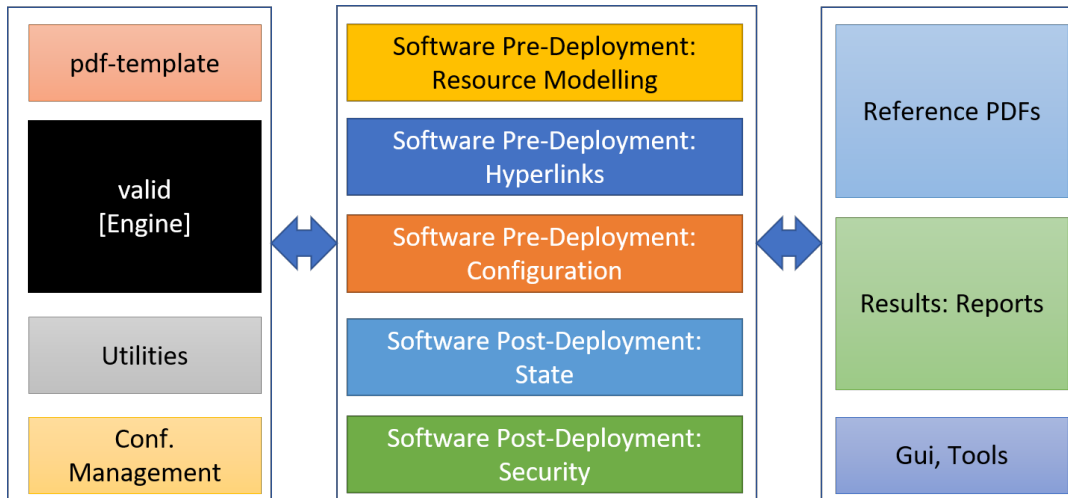


Architecture

There will be two versions with single code-base.

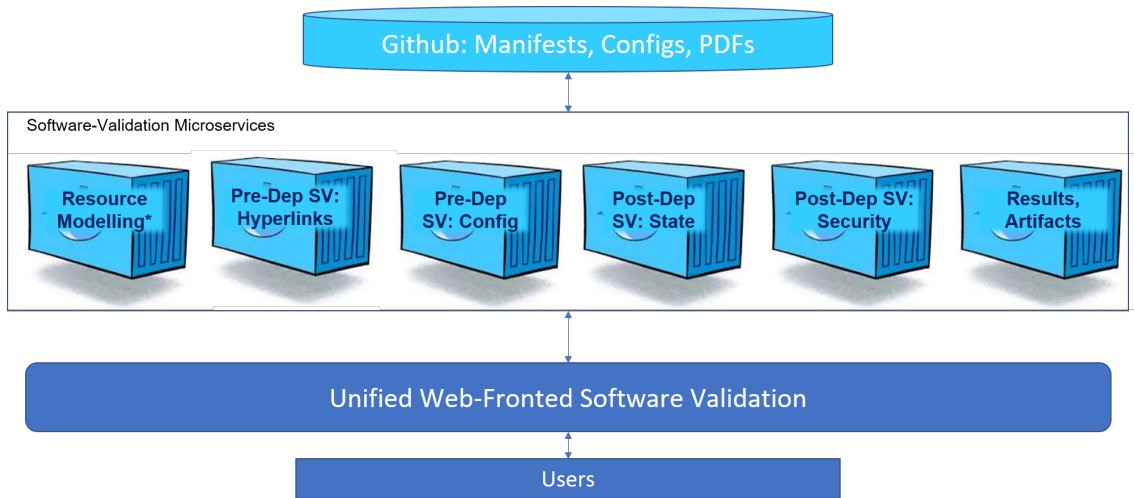
Version-1

The below figure provides the software architecture of the SDV. The user only runs 'valid' program, and select one or more validations.



Version-2

The containerized version.



Testcases

The initial testcases can be found here: <http://testresults.opnfv.org/test/#/projects/cirv>

Pre-Deployment Software Validation: Hyperlinks

The below table and excel-sheet summarizes the links for which the connectivity is to be checked. Along with the connectivity, the 'Latency' can also be noted.

PS: The table (sources) and the excel (images) are specific to Airship. For other deployments, the components and corresponding repo-names and tags may vary.

Images

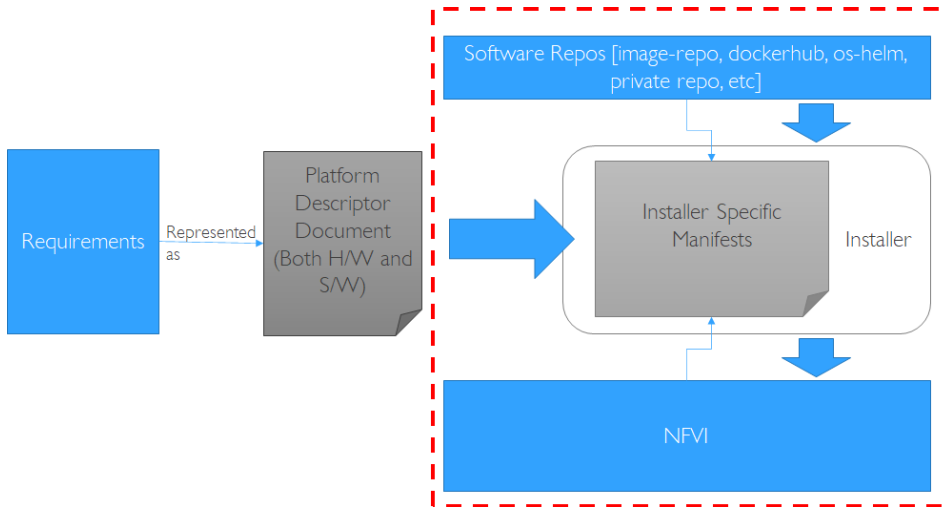
[Airship-Images.xlsx](#)

Sources

Sl. No.	Component	Repository-Name	Tags	URL to use
1	Neutron	openstack-helm /neutron	d2abe39d498f48c4721e26aca 19e81189bc8891b	https://opendev.org/openstack/openstack-helm
2	helm-toolkit	openstack-helm-infra /helm-toolkit	03580ec90afa162c166661acf2 7f351b83565375	https://opendev.org/openstack/openstack-helm-infra
3	nova	openstack-helm /nova	d2abe39d498f48c4721e26aca 19e81189bc8891b	https://opendev.org/openstack/openstack-helm
4	openvswitch	openstack-helm-infra /openvswitch	d0b32ed88ad652d9c2226466a 13bac8b28038399	https://opendev.org/openstack/openstack-helm-infra
5	calico, libvirt, mariadb, memcached, rabbitmq, postgresql, ceph-client, ceph-mon, ceph-osd, ceph-provisioners,	openstack-helm-infra /< >	03580ec90afa162c166661acf2 7f351b83565375	https://opendev.org/openstack/openstack-helm-infra
6	apiserver, calico/etcd, controller-manager, coredns, etcd, haproxy, ingress, proxy, scheduler, promenade	charts/< >	64807416b71958e31156ef7a5 0e169813acc4e15	https://opendev.org/airship/promenade
7	barbican, cinder, glance, heat, horizon, keystone, tempest	openstack-helm-infra /< >	52c132b9356695bf455ae25ec 78cef9f532f9e8	https://opendev.org/openstack/openstack-helm
8	tiller	charts/tiller	50384e47c762438b9e39abe46 77f3c29f3c09184	https://opendev.org/airship/armada
9	calico-utility, ceph-utility, compute-utility, etcd-utility, mysqlclient-utility, openstack-utility, postgresql-utility	charts/<>	9c2038cb59bfb3ff5c3bbf11c7 001d621437b98	https://opendev.org/airship/porthole

Pre-Deployment Software Validation: Configuration

Apart from ensuring that the requirements are met, this validation helps in minimizing/eliminating any deployment errors, drives test-automation, and checks for consistency to achieve efficient automation. The below picture summarizes the scope (in red dashed rectangle) of the software validation.



This software validation can be: (a) 'Pre-Deployment' Software Validation (b) NW Links Validation (c) Post-Deployment Software Validation

The below table summarizes validation of different configurations. The table uses Airship and its configurations as an example.

SI - No	Validation-Parameter	expected value	File To look at (Applies to AIRSHIP ONLY)	"Key" to match (Applies to AIRSHIP ONLY)	Requirement Level
1	OS	ubuntu xenial	global/software/charts/ucp/drydock/maas.yaml type/cnnt/profiles/host/*	default_os: image:	Mandatory
2	HugePage Configuration	size: 1G count: 32 (minimum)	profiles: type/cnnt/profiles/hardware/* site/<site_name>/profiles/hardware/*	hugepages: dpgk: size: count:	Mandatory
3	CPU Isolation	Ex: 4-43, 48-87	same as above	cpuset: kvm: vcpu_pin_set	Mandatory
4	Openstack Version	ocata/pike/stein	No Single Explicit Location. global/software/config/versions.yaml includes the mention of the version	osh: <service_name>: <service_component>:*ocata*	Mandatory
5	Openstack Services ?	ingress-controller, ceph-config,, mariadb, rabbitmq, memcached, keystone, radosgw, glance, cinder, compute-kit, heat, horizon	type/cnnt/software/manifests/full-site.yaml global/software/manifests/full-site.yaml		Mandatory ?
6	Virtual-Switch	openvswitch openvswitch-dpdk	Config only - Version as supported by OSH site/<podname>/software/charts/osh /openstack-compute-kit/chart-group.yaml	chart_group: - openvswitch-dpdk - neutron-ovsdpdk	Mandatory
7	Version of the Manifests	1.7	site/<site-name>/site-definitions.yaml	revision:	Mandatory
8	Node-Names ?	list of all the names.	site/<site_name>/baremetal/nodes.yaml	name:	Mandatory ?
10	bootstrap protocol ?	pxe	profiles: type/cnnt/profiles/hardware/* site/<site_name>/profiles/hardware/*	bootstrap_protocol:	Mandatory ?

SI - No	Validation-Parameter	expected value	File To look at (Applies to AIRSHIP ONLY)	"Key" to match (Applies to AIRSHIP ONLY)	Requirement Level
1	Hypervisor	kvm	global/software/charts/osh/openstack-compute-kit/nova.yaml	virt_type:	Optional
2	Container Engine	docker	global/software/config/versions.yaml	repositories: docker:	Optional
3	Container Management	kubernetes	NA	NA	Optional
4	k8S components	proxy, container-networking, dns, etcd, haproxy, core	type/cntt/software/manifests/full-site.yaml global/software/manifests/full-site.yaml		Optional
5	Ceph Components	mds, mon, osd, rgw, mgr	type/cntt/profiles/genesis.yaml ----- type/cntt/software/config/endpoints.yaml	labels: dynamic: <ceph-*>: enabled ----- data: <tenant-ceph-*>:	Optional
6	K8S Networking	calico	No single explicit location.		Optional
7	LMA Components - Client Side	promethues-openstack-exporter fluentbit	type/cntt/software/manifests/full-site.yaml global/software/manifests/full-site.yaml		Optional
8	LMA Components - Server Side	infra-logging, infra-monitoring, infra-dashboards	type/cntt/software/manifests/full-site.yaml global/software/manifests/full-site.yaml		Optional
9	Special NIC Drivers	ixgbe or i40e	baremetal/bootactions/*.yaml	The complete file.	Optional
10	Users				Optional
11	UCP Components	ceph-update, ceph-config, core, keystone, divingbell, armada, deckhand, drydock-scaled, promenade, shipyard,	type/cntt/software/manifests/full-site.yaml global/software/manifests/full-site.yaml		Optional
12	Tenant Ceph Components	tenant-ceph (mgr, mon, rgw)	type/cntt/profiles/genesis.yaml ----- type/cntt/software/config/endpoints.yaml	labels: dynamic: <tenant-ceph-*>: enabled ----- data: <tenant-ceph-*>:	Optional
13	Post-Dep N/W Config Script				Optional
14	Site-Type	cntt	site/<site-name>/site-definitions.yaml	site_type:	Optional
15	Version of the Manifests	1.7	site/<site-name>/site-definitions.yaml	revision:	Optional
16	OVS DPDK Configuration	Non-Datapath Threads, PMD Threads OVS-Bridge name	profiles: type/cntt/profiles/hardware/* site/<site_name>/profiles/hardware/* ----- type/cntt/network/common-addresses-ovsdpdk.yaml	cpu_sets: dpdk-lcore-mask: pmd-cpu-mask: ----- bridge_for_ovsdpdk	Optional

Network-Links Validation

Some of the options we have:

1. Run LLDPtool on compute and control nodes – easiest to implement, but, it can get complex if the number of nodes are more.
2. LLDP on TORs - Reuse the solutions that used by 'data centers' – opensource and scalable. It may take slightly more time.

We propose to use Option-1. The first problem is topology representation. If PDF 2.0 does not include this in its description, we will use DOT-Specified network graph .

Post-Deployment Software Validation : State

Sl. No.	Validation Type	Description
1	Container or POD Status	Ensure container status is OK. Detect failed containers and raise an error
2	Required Container ports are open	Ensure relevant docker containers are up and running, with ports open to listen
3	ntp	Verify all deployed nodes have their clock synchronized
4	OVS-DPDK Configuration	Validates OVS DPDK PMD cores from all NUMA nodes
5	RabbitMQ Limits	Make sure the rabbitmq file descriptor limits are set to reasonable values
6	Service Status	Detect services status on the target host and fails if we find a failed service.
7	SELinux	Ensure we don't have any SELinux denials on the system
8	TLS configuration	Ensure endpoints are secured.
9	Storage (Ceph) Health Check	Health should be OK

Post-Deployment Software Validation: Security

Sl. No.	Validation Type	Description
1	Security: Right File Permissions	https://docs.openstack.org/security-guide/checklist.html
2	Security: Right Configurations	https://docs.openstack.org/security-guide/checklist.html

Readouts

SDVState readouts

Readout	Author	Slides	Notes
SDVState announcement at LFN Mentorship Project Presentation	Parth Yadav	 A placeholder image for a PDF document titled "SDV State...ation.pdf". The image shows a paperclip icon and the text "SDV State...ation.pdf" below it.	